

REMARKS

Reconsideration of the above-identified patent application in view of the amendments above and the remarks following is respectfully requested.

Claims 1-28 are in this case. Claims 13 and 14 have been rejected under § 112, second paragraph. Claims 1, 2, 6-8, 12, 15-20 and 24-28 have been rejected under § 102(b). Claims 3-5, 9-11, 13, 14 and 21-23 have been objected to. Dependent claims 2-5, 8-11 and 21-23 have been canceled. Independent claims 1, 7, 13, 15, 17-19, 25 and 28 have been amended. New claims 29-72 have been added.

The claims before the Examiner are directed toward a ruggedized device driver for a non-volatile storage device and towards methods by which a file system or an application use the device driver. In addition to regular commands issued by the file system to the device driver, the device driver supports two new commands: a command that defines the current data contents of the storage device as a fall-back state in case of failure and a command that defines current data contents of the storage device as a new consistent state.

§ 112, Second Paragraph Rejections

The Examiner has rejected claims 13 and 14 under § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Specifically, the Examiner has pointed out that the word “possibly” in claim 13 makes it unclear whether a command to the device driver is generated.

The lack of clarity in claim 13 now has been resolved by replacing the word “possibly” with the word “thereby”.

§ 102(b) Rejections – Fuller ‘168

The Examiner has rejected claims 1, 2, 6-8, 12, 15-20 and 24-28 under § 102(b) as being anticipated by Fuller, US Patent No. 5,778,168 (henceforth, “Fuller ‘168”). The Examiner’s rejection is respectfully traversed.

Claims 2 and 8 have been canceled, thereby rendering moot the Examiner’s rejection of these claims.

Fuller ‘168 teaches a ruggedized device driver, for a Unix operating system, that supports three Unix File System (UFS) commands for guaranteeing that, upon recovery from system failure, a mass storage device will be in a consistent state. The TRANS_BEGIN() command defines the present state of the mass storage device as a fall-back state. The TRANS_DELTA() command logs subsequent changes to the contents of the mass storage device. The TRANS_END() command “commits” those changes, thereby defining a consistent state of the mass storage device.

The crucial difference between the present invention and the teachings of Fuller ‘168 is that the device driver of the present invention supports, in addition to the regular commands issued by the file system, only two new commands for ensuring that the storage device is in a consistent state upon recovery from failure: a first command equivalent to the TRANS_BEGIN() command of Fuller ‘168 and a second command equivalent to the TRANS_END() command of Fuller ‘168. Subsequent to issuing the first command, the file system uses its regular commands to change the contents of the storage device, and no special equivalent of the TRANS_DELTA() command of Fuller ‘168 is needed.

Thus, the present invention is not anticipated by Fuller ‘168. Furthermore, the present invention is not obvious from Fuller ‘168. Fuller ‘168 needs a TRANS_DELTA() command because Fuller ‘168 obtains ruggedness by adding a log

to the device driver and explicitly logging changes to the contents of the mass storage device subsequent to the TRANS_BEGIN() command. The present invention obtains ruggedness by a different method that does not use a log and that is neither hinted nor suggested by Fuller '168, and so does not need an equivalent of the TRANS_DELTA() command of Fuller '168.

The present invention, from the point of view of the file server, is described in the specification on page 9 lines 7-14:

...any operation that the FS wants to become atomic...is executed by the FS in the following manner:

- a. Tell the device driver that the current state is a “fall-back” state, into which the system should wake up if interrupted prior to completion of the sequence.
- b. Do any operations required by the FS, including erasing, writing or overwriting blocks.
- c. Tell the device driver that the atomic sequence is complete, and that a new consistent state is hereby defined. (emphasis added)

and on page 9 line 18 through page 10 line 3:

Except for activating this “atomicity” feature as described above, the FS does not have to be aware of any implementation detail of the ruggedness solution. This novel approach enables the improvement on all the disadvantages listed above:

- a. Any FS running on top of the ruggedized device driver can utilize its ruggedness capability, regardless of its unique structures and algorithms. There is no longer a need for specially designed ruggedized file systems. The only adaptation that should take place in the file system code is the insertion of the “atomicity” calls described above, around the sequences of driver calls to be “atomized”. (emphasis added)

Therefore, new claims 45-72 have been added. New independent claims 45, 51, 57, 59, 61-63, 69 and 72 are, respectively, independent claims 1 and 7 as filed, independent claim 13 as amended to overcome the § 112, second paragraph rejections, and independent claims 15, 17, 18, 19, 25 and 28 as filed, amended to state that the second new command defines a new consistent state (as supported by the

above citation from page 9 lines 7-14 of the specification), and that only the two new commands are added (as supported by the above citation from page 9 line 18 through page 10 line 3).

New independent claims 45, 51, 57, 59, 61-63, 69 and 72 now feature language which makes it absolutely clear that the device driver of the present invention adds only two new commands to the set of commands used by the file system to control the device driver: a first new command that defines the current data contents of the storage device as a fall-back state in case of failure and a second new command that defines, as a new consistent state, the data contents of the storage device that result from the file system issuing, subsequent to the first command, other commands that potentially change the data contents of the device. Applicant believes that the amendment of the claims completely overcomes the Examiner's rejections on § 102(b) grounds.

New dependent claims 46-50, 52-56, 58, 60, 64-68, 70 and 71 correspond to dependent claims 2-6, 8-12, 14, 16, 20-24, 26 and 27 as filed and bear the same relationship to new independent claims 45, 51, 57, 59, 63 and 69 as dependent claims 2-6, 8-12, 14, 16, 20-24, 26 and 27 as filed bear to independent claims 1, 7, 13, 15, 19 and 25 as filed. New dependent claims 46-50, 52-56, 58, 60, 64-68, 70 and 71 are allowable by virtue of depending from new independent claims 45, 51, 57, 59, 63 and 69. In addition, new dependent claims 47-49, 53-55 and 65-67 are allowable by virtue of corresponding to original claims 3-5, 9-11 and 21-23 that were only objected to by the Examiner.

Returning now to claims 1, 6, 7, 12, 15-20 and 24-28, as described below, independent claims 1, 15, 17 and 18 have been placed in condition for allowance by the inclusion therein of the limitations of claims 2 and 3, independent claim 7 has

been placed in condition for allowance by the inclusion therein of the limitations of claims 8 and 9, and independent claims 19, 25 and 28 have been placed in condition for allowance by the inclusion therein of the limitations of claim 21. It follows that claims 6, 12, 16, 20, 24, 26 and 27, that depend therefrom, also are allowable.

Objections

The Examiner has objected to claims 3-5, 9-11 and 21-23 as being based on rejected base claims. The Examiner has noted that claims 3-5, 9-11 and 21-23 would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claim.

Claim 3 has been rewritten in independent form by amending claim 1 to include the limitations of claims 2 and 3. Correspondingly, claims 2 and 3 have been canceled.

Claim 9 has been rewritten in independent form by amending claim 7 to include the limitations of claims 8 and 9. Correspondingly, claims 8 and 9 have been canceled.

Claim 21 has been rewritten in independent form by amending claim 19 to include the limitations of claim 21. Correspondingly, claim 21 has been canceled.

Similar to the amendment of claim 1, independent claims 15, 17 and 18 have been placed in condition for allowance by the inclusion therein of the limitations of claims 2 and 3. Similar to the amendment of claim 19, independent claims 25 and 28 have been placed in condition for allowance by the inclusion therein of the limitations of claim 21.

Claim 4 has been rewritten in independent form as new claim 29. Claim 10 has been rewritten in independent form as new claim 30. Claim 22 has been rewritten in independent form as new claim 34. Correspondingly, claims 4, 10 and 22 have

been canceled. In addition, new independent claims 31-33, 35 and 36 have been added. New independent claims 31-33 are claims 15, 17 and 18 as filed, with the inclusion therein of the limitations of claims 2 and 4. New independent claims 35 and 36 are claims 25 and 28 as filed, with the inclusion therein of the limitations of claim 22.

Claim 5 has been rewritten in independent form as new claim 37. Claim 11 has been rewritten in independent form as new claim 38. Claim 23 has been rewritten in independent form as new claim 42. Correspondingly, claims 5, 11 and 23 have been canceled. In addition, new independent claims 39-41, 43 and 44 have been added. New independent claims 39-41 are claims 15, 17 and 18 as filed, with the inclusion therein of the limitations of claims 2 and 5. New independent claims 43 and 44 are claims 25 and 28 as filed, with the inclusion therein of the limitations of claim 23.

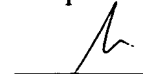
The Examiner has objected to claims 13 and 14 as containing rejected subject matter. The Examiner has noted that claims 13 and 14 would be allowable if rewritten to overcome the rejected subject matter. As described above, claims 13 and 14 have been so rewritten.

Other Amendments to the Claims

To facilitate editing the claims, the periods that followed the letters (a, b, c, d) and numbers (i, ii, iii) in the independent claims that denote the separate claim elements have been replaced with parentheses.

In view of the above amendments and remarks it is respectfully submitted that independent claims 1, 7, 13, 15, 17-19, 25, 28-45, 51, 57, 59, 61-63, 69 and 72, and hence dependent claims 6, 12, 14, 16, 20, 24, 26, 27, 46-50, 52-56, 58, 60, 64-68, 70 and 71 are in condition for allowance. Prompt notice of allowance is respectfully and earnestly solicited.

Respectfully submitted,



Mark M. Friedman
Attorney for Applicant
Registration No. 33,883

Date: October 19, 2004